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ABSTRACT

In the study of language acquisition, one of the central problems is how to bridge a qualitative gap between the primary linguistic data (PLD) that children are exposed to and the final state of a particular grammar that children acquire. Universal Grammar (UG) is assumed to play a crucial role in this problem. The aims of this report are: (1) to specify which subsystems of UG are involved in the course of acquiring derived nouns or what is given innately for the acquisition of derived nouns, if specified, (2) to make explicit what kind of information children have to receive from the PLD in order to get the same knowledge that adults have for derived nouns, and (3) to propose a learning model that is compatible with conditions (1) and (2). It is shown that derived nouns are productively acquired in accordance with the learning model proposed, and that uniformity condition, which is assumed to be included in UG, regulates the occurrence of overgeneralization. (VWL)

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SOME PROBLEMS IN THE ACQUISITION OF DERIVED NOUNS*

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1. Introduction

In the study of language acquisition, one of the central problems is how to bridge a qualitative gap between the primary linguistic data (PLD) which children are exposed to and the final state of a particular grammar that children acquire. Universal Grammar (UG) is assumed to play a crucial role in this problem. The aims of this paper are (1)to specify which subsystems of UG are involved in the course of acquiring derived nouns or what is given innately for the acquisition of derived nouns, if specified, (2)to make explicit what kind of information that children have to receive from the PLD in order to get the same knowledge that adults have for derived nouns, and (3)to propose a learning model which is compatible with conditions (1) and (2). Following a standard version of GB-theory, I will assume that UG consists of the following subsystems: X-bar theory, theta theory, Case theory, government theory, binding theory, bounding theory, control theory.

In the studies of derived nouns in generative grammar, it has been widely assumed that derived nouns and their base verbs share the same syntactic or semantic properties, based on X-bar theory and the lexicalist hypothesis (Chomsky 1970).

(1)a. The enemy destroyed the city.
b. The enemy's destruction of the city

The enemy in (1a), for example, is the subject or the agent of the verb *destroy*, and *the city* is the object or the patient of *destroy*. The same relation holds in the derived nominal (1b): *the enemy* is the subject or the agent of the derived noun *destruction*, and *the city* is the object or the patient of *destruction*. The basic problem which I will consider in this paper is how children come to get knowledge of this parallel relation. There are two potential ways to answer this problem. One is that children first learn syntactic or semantic properties of a verb and of its derived noun separately, and

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correlate them later. The other is that children learn syntactic or semantic properties of a base verb first and deduce those of the derived noun from the verb's at a later stage. If we take the former, on the one hand, children have to get evidence for both a base verb and its derived noun from the PLD in order to learn them. On the other hand, if we choose the latter way, children do not have to learn the syntactic or semantic properties of a derived noun by getting evidence from the PLD. In this paper, I will pursue this latter direction.

In the next section, I will propose a learning model, which is a modified version of Randall's (1985). The learning model itself is not sufficient for children to avoid overgeneralization, but the model is necessary to explain a productive aspect of language acquisition. In section 3, I will first point out several kinds of data which would involve children following the proposed learning model in a problem of overgeneralization. I will then suggest that the overgeneralization of nominalization does not occur, based on the continuity hypothesis of UG. The basic assumption is that the learning model is in favor of a productive aspect of acquisition while principles of UG take a role in ruling out unwanted output from the beginning of acquisition. As for the necessity of the proposed model, section 4 will be devoted to the investigation of derived nouns which take a content *that*-clause.

2. Learning Models of Derived Nouns

I will first review a learning model which is based on the assumption that derived nouns basically share the same syntactic properties as the base verbs. Randall (1985) has proposed the following model:

(2)a. a morphologically complex form is seen to be related to verbal base
b. assume the maximal relation possible: inherit the full subcategorization of the base verb as the subcategorization for the derived item, provided there is no evidence that both meaning and category differ
c. elsewhere, (where there is evidence of differences in both category and meaning), inherit only the unmarked portion of the base verb's subcategorization, either transitive or intransitive (Randall 1985: 101)

This learning model assumes that whether deverbal nouns have the same subcategorization frame as their base verb depends upon the type of affixes which create the derived nouns. Her classification of the affixes is as follows:

(3)

MEANING CHANGE	CATEGORY CHANGE +	CATEGORY CHANGE -
+	-[ing]A -[ion]N -[er]N -[ment]N -[able]A -[y]N -[al]N -[ed]A -[en]A	[re]- [un]- [counter]-
-	-[ing]N	inflectional affixes

(Randall 1985: 61)

According to this classification, the suffixes *-ment, -y, -ion, -al,* and *-er* belong to the [+meaning change] class, while the suffix *-ing* belongs to the [-meaning change] class. This classification predicts a contrast as between (5) and (6):

(4)a. We ran [into the tunnel] [without a flashlight].
b. To collect garbage [without gloves] can be messy.
c. We didn't think we could move the piano [out of the dining room].

(5)a. *I saw a runner into the tunnel without a flashlight.
b. *The collection of garbage without gloves can be messy.
c. *We didn't think the piano was moveable out of the dining room.

(6)a. The running into tunnels without a flashlight is prohibited.
b. The collecting of garbage without gloves can be messy.
c. The moving of the piano out of the dining room took 3 hours.

(Randall 1985: 199)

Her explanation is as follows. Since the suffixes of the

derived nouns in (5), *runner*, *collection*, and *moveable* all have the feature [+category change, +meaning change], these derived nouns cannot inherit the full subcategorization frames of the base forms. In contrast, derived nouns in (6) can inherit the full subcategorization frames since the suffix *-ing* has the feature [+category change, -meaning change].

Note here that the bracketed phrases in (4) are not in fact the phrases which the verbs are subcategorized for. The contrast between (5) and (6) is supposed to illustrate the possibility for derived nouns to take adjunct phrases in the same way as their base verbs.

As for suffixes which create derived nouns, Grimshaw (1990) correlates the type of suffixes with the presence or the absence of the argument structure of derived nouns: it is suggested that whether a derived noun has the same argument structure as its base verb (except for its external argument) is determined by the type of suffixes. If a suffix introduces *Ev* to a derived noun as an external argument, on the one hand, the derived noun has the same arguments as its base verb. On the other hand, if a suffix introduces *R*, the derived noun has no argument structure. Following Grimshaw's basic idea that the type of suffixes affects the possibility of the inheritance of argument structure, I assume that the suffixes *-ment*, *-y*, *-tion*, *-al* and *-ing* all have the same feature [-affect argument structure] while the suffix *-er* has [+affect argument structure], and that the classification of suffixes is as follows:

(7)

ARGUMENT STRUCTURE AFFECTING	CATEGORY CHANGE +	CATEGORY CHANGE -
+	-[er]N -[able]A ...	[re]- [un]- [counter]- ...
-	-[ing]N -[al]N -[ment]N -[y]N -[tion]N ...	inflectional affixes

Based on the affix classification (7), I will modify the learning model (2) in the following way:

(8)(i) The argument structure of a base form is acquired.
(ii) A morphologically complex form is seen to be related to the base form.
(iii) Features of a relevant affix are recognized.
(iv)a. Inherit the full argument structure of the derived form as the argument structure of the derived form, provided that there is no evidence that the affix has [+category change, +argument structure affecting].
b. Elsewhere, (where there is evidence of differences in both category and argument structure), inherit the argument structure of the base form as the argument structure of the derived form in a conservative way.

In addition to this model, children acquiring English have to learn an English particular part of the Case-marking system: genitive *'s* is for a noun appearing in the subject position of the noun phrase and the preposition *of* for one in the object position. Note that the basic idea of this model is that the derived form inherits the full argument structure from the base form unless the affix has the two features [+category change] and [+argument structure affecting] at the same time. Basically children do not have to learn the argument structure of a derived noun by getting evidence from the PLD, but can get knowledge of the argument structure of a derived noun from that of its base form.

3. Relationship between Learning Model and UG

In this section, I will point out several cases where the parallelism between the base form and the derived form cannot be maintained, regardless of the type of suffixes, and consider a problem of overgeneralization which the learning model proposed in the previous section could arise. In doing so, I will make explicit the relationship between the learning model above and UG.

There are some constructions that have no corresponding nominals. The contrast between a. and b. of examples (9) to (14) illustrates this point. Consider the examples in (9a) first. Both of them are so called subject-to-subject raising

constructions. As shown in (9b), the corresponding nominals are not allowed in English. The same is true for the exceptional Case-marking construction shown in (10), the *tough*-construction in (11), the small clause construction in (12), the double object construction in (13):

(9)a. John appeared to have left.
John was likely to win.
b. *John's appearance to have left
*John's likelihood to win (Abney 1987: 129)
(10)a. I expected John to win.
b. * my expectation of John to win (Ibid: 129)
(11)a. John is tough to please.
b. *John's toughness to please (Ibid: 135)
(12)a. I believe John a fool.
b. *my belief of John a fool (Ibid: 131)
(13)a. I gave Bill a book.
b. *the gift of Bill (of) a book (Ibid: 132)

Derived nominals cited above raise an overgeneralization problem with the learning model (8): children would incorrectly judge them as proper forms if they followed the learning model (8) only. Suppose that a child who knows the verb *expect* (stage (8i)) comes to know that the word *expectation* is morphologically related to the verb *expect* (stage (8ii)) and that s/he has known that the suffix *-tion* has the features [+category change, -argument structure affecting] (stage (8iii)). (8iv.b) could lead the child to incorrectly conclude that the derived nominal (10b), which corresponds to (10a), is a proper form. The same is true for the other derived nominals cited above.

It is difficult to imagine that every child acquiring English gets the negative evidence that derived nominals as in (9-13) are not allowed in English. It is much more plausible to assume that a part of UG rules out those derived nominals so that this kind of overgeneralization should not occur. The uniformity condition proposed by Chomsky (1986) is one feasible candidate for this purpose:

(14) Uniformity Condition
If α is an inherent Case-marker, then α Case-marks NP if and only if θ-marks the chain headed by NP
(Chomsky 1986: 194)

Given this condition, derived nominals in (9-13) are correctly ruled out. Suppose that derived nominal (9b) has the following structure:

(15)a. *John's appearance [*t* to have left]
b. *John's likelihood [*t* to win]

According to the condition (14), the trace of *John* (*t*) must be theta-marked by the derived noun *appearance* at D-structure to be Case-marked, but it is not, thus it is correctly ruled out. The same explanation holds true for derived nominals in (10b) and (11b), assuming the following structure:

(16)a. *my expectation of John [*t* to win]
b. *John's toughness [to offend *t*]

As for derived nominal (12b), while the bracketed phrase is theta-marked by the derived noun, *John* itself is not:

(17) *my belief [of John a fool]

In order to rule out a derived nominal like (13b), a stipulation is needed, in addition to the uniformity condition, that 'the rule of *of*-insertion is a "default case", applying only when there is no preposition available that inherently assigns the appropriate θ-role'(Chomsky 1986: 194). In the double object construction, the indirect object is Case-marked by a suitable preposition in the derived nominal: 'the gift to Bill of a book' is allowed. [1]

In any cases cited in (9-13), the learning model (8) could raise the problem of overgeneralization, while the uniformity condition, which is assumed to be a part of UG, prevents children from overgeneralizing. [2] Thus the learning model of the derived noun and the uniformity condition play complementary roles: the former contributes to the productive acquisition of derived nouns and the latter limits the possible forms.

4. Evidence for Productive Learning of Derived nouns

In the previous section, I considered several constructions which children would overgenerate without a certain constraint of UG. This section now focuses on one of the cases in which the proposed model is supposed to play a crucial role in the course of acquisition of derived nouns.

To begin with, let us look at examples in (18):

(18)a. Bill's explanation that he was temporarily insane
a'. Bill explained that he was temporarily insane.
b. his awareness that he is ignorant
b'. He is aware that he is ignorant.
c. the news that our team won the race

(18a) is a deverbal nominal which corresponds to the sentence (18a'). (18b) is a de-adjectival nominal which corresponds to the sentence (18b'). (18c) has no such corresponding sentence. The derived nouns *explanation* in (18a) and *awareness* in (18b), and the simple noun *news* in (18c) all occur with a content *that*-clause. In English, not all simple nouns which can be associated with some propositional content occur with a content that-clause of this kind, as shown in (19):

(19)a. *the tale/talk/story that Bill went to the North Pole
b. the fact/news/rumor that Bill went to the North Pole

It seems to be an idiosyncratic property of the noun whether a given simple noun can take a content *that*-clause or not. So children would have to learn one by one which noun can take a *that*-clause by receiving input from adults actually using that noun with a *that*-clause. As for the derived nouns, however, it is predictable which noun can take a *that*-clause, because if the base form can take a *that*-clause, the derived noun can also take a *that*-clause, as shown in (18a-b'). Therefore given the learning model proposed in (8), children do not need input from adults using noun phrases like those in (18a) and (18b) in order to learn that derived nouns like *explanation* and *awareness* can take a *that*-clause. As for the case of simple nouns like (19), since the learning model is not applicable, children have to learn one by one which noun can take a *that*-clause by actually receiving relevant inputs.

To sum up, I have claimed that nouns which take a content *that*-clause are divided into two classes, derived nouns and simple nouns, and that nouns of these two classes are acquired in different ways. One way is based on the rule-governed nature of the verb-noun relation. It is not necessary for derived nouns cooccurring with a content *that*-clause to appear in the PLD, because children can deduce that certain derived nouns can take a that-clause based on what they have learned about their base forms, given the learning model proposed in (8). The other way is item-by-item learning. This is for the simple nouns which can take a *that*-clause.

In the following subsections, I will discuss two kinds of evidence which support the claim just made above. One assumption for the discussion is that the process of acquisition affects the resultant state of acquisition. Section 4.1 will be devoted to supporting the claim that the derived noun with a content *that*-clause and the simple noun with that is acquired in different ways, and section 4.2 will provide supporting data for the way of learning derived nouns.

4.1. The Property of Content That-Clauses

First of all, for derived nouns, let us look at the examples in (20) and (21):

(20)a. Paul explained that he was insane.
b. Paul's explanation that he was insane
c. Paul's explanation was that he was insane.
(21)a. They knew that Dukakis was ahead.
b. the knowledge that Dukakis was ahead
c. *The knowledge was that Dukakis was ahead.

Both *explanation* and *knowledge* are derived noun, base forms of which take a *that*-clause. As shown in (20c) and (21c), however, while *explanation* allows its content *that*-clause to appear in the complement position of a copular sentence, *knowledge* does not. Derived nouns are thus divided into two types: *explanation*-type and *knowledge*-type. For example, nouns like *argument, conclusion, speculation,* and so on belong to *explanation*-type, and nouns like *determination, insistence,* and so on belong to *knowledge*-type. [3]

As for simple nouns, they all belong to one type, that is,

explanation-type. In other words, all content *that*-clauses which occur with simple nouns can be separated from the simple nouns by *be* in the copular sentence (cf. (20c)).

4.2. Evidence for Inheritance

There is another piece of supporting evidence for my claim. To begin with, look at the examples in (22-23):

(22)a. the likelihood that John will get married
b. John's anger that he was not chosen
(23)a. It is likely that John will get married.
b. John was angry that he was not chosen.

Both *likelihood* and *anger* are de-adjectival nouns. The noun *likelihood* is derived from the adjective *likely*, which takes formal *it* as a subject, and the noun *anger* is derived from the adjective *angry*, which takes an animate subject. As shown in examples in (24), *likelihood* belongs to *explanation*-type, and *anger* belongs to *knowledge*-type:

(24)a. The likelihood is that John will get married.
b. *John's anger was that he was not chosen.

Further examples of de-adjectival nouns of *explanation*-type are *possibility* and *probability*, and those of *knowledge*-type are *awareness, confidence, happiness*, and so on.

Now look at the examples in (25-27):

(25)a. It's almost certain that the government will lose the next election.
b. He is certain that she will recover.
(26)a. the certainty that the government will lose the next election
b. his certainty that she will recover
(27)a. The certainty is that the government will lose the next election.
b. *His certainty is that she will recover.

Certainty is a derived noun the base form of which is the adjective *certain*, which takes either formal *it* or an animate noun as a subject. When the base form *certain* takes formal *it*

as a subject, its derived form, as shown in (27a), belongs to *explanation*-type. When the base form *certain* takes an animate subject, on the other hand, its derived form, as shown in (27b), belongs to *knowledge*-type.

To sum up our discussion of (22) to (27), nouns derived from adjectives which take formal *it* as a subject cannot appear as a subject of the copular sentence if they are separated from their content *that*-clause, while nouns derived from adjectives taking an animate subject can. This shows that the property of a derived noun correlates with that of its base form, which is consistent with the course of acquisition of derived nouns based on the learning model proposed in (8).

5. Conclusion

In this paper, I have shown that derived nouns are productively acquired in accordance with the learning model (8), and that the uniformity condition, which is assumed to be included in UG, regulates the occurrence of overgeneralization. The tasks for children acquiring derived nouns are (a)to acquire the argument structure of a base form, (b)to correlate a morphologically complex form with the base form, (c)to recognize the features of an affix attached to the base form, and (d)to acquire the Case-marking system of a particular language. The former three (a-c) are included in the learning model (8), and the last one (d) is necessary for getting the uniformity condition to start to work.

NOTES

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stylistic corrections for this paper. Any remaining inadequacies are of course my own.

[1] The derived nominal in (iib) remains unexplained in the discussion here:

(i)a. I presented the award to John.
b. I presented John with award.
(ii)a. my presentation of the award to John
b. *my presentation (of) John with the award
(Abney 1987: 133)

[2] Unlike the cases of (9-13), the following examples are supposed to be constrained by certain semantic conditions:

(i)a. Mary frightened/amused/angered/bored/liked/hated John.
b. *Mary's fright/amusement/anger/boredom/like/hate of John (Abney 1987: 126)
(ii)a. I can tell that the cake is tempting John.
The devil tempted Jesus.
b. *the cake's temptation of John
the devil's temptation of Jesus (Ibid: 127)
(iii)a. John realized his mistake.
John realized his fondest dreams.
b. *John's realization of his mistake
John's realization of his dreams (Ibid: 127)
(iv)a. John weighed 180 pounds.
That book costs $20.00.
John resembles his father.
b. *John's weighing/weight of 180 pounds.
*That book's costing/cost of $20.00.
*John's resembling/resemblance of his father
(Ibid: 125)
(v)a. I knew the facts. I knew the time.
b. my knowledge of the facts *my knowledge of the time
(Ibid: 146)

In example (i), the base forms are psych verbs and derived nouns do not denote an action or an event but denote a mental state. The contrasts in (ii) and (iii) illustrate that the derived noun cannot take an object when it denotes a mental state while the derived noun can take an object when it denotes an action or an

event. In examples (iv) and (v), the object of the base verb is not a typical one: objects in (iv) are not something affected by the verb and objects in (v) denote the proposition, which is canonically realized by a clause.

I will leave these data with just a descriptive mention here. A principled way to explain this kind of discrepancy between a base form and a derived form must await further investigation.

[3] See Endo (1992) for further examples and analysis.

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